

Amendments to the Claims

This listing of claims will replace all prior versions, and listings of claims in the application.

1. (canceled)

2. (canceled)

3. (canceled)

4. (canceled)

5. (canceled)

6. (canceled)

7. (canceled)

8. (canceled)

9. (canceled)

10. (currently amended) A receiver, comprising:

a substrate;

a first mixer that performs up-conversion and is disposed on the substrate;

a differential filter coupled to an output of the first mixer; and

a second mixer that performs down-conversion and provides image rejection,

disposed on the substrate and coupled to an output of the differential filter;

wherein the differential filter is external to the substrate and has a passband that is determined to pass an up-converted output of the first mixer.

(~~N~~) (previously added) The receiver of claim 10, wherein the differential filter is a surface acoustic wave (SAW) filter.

12. (canceled)

13. (canceled)

~~14.~~ (previously presented) The receiver of claim 10, wherein the substrate is processed using CMOS.

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15. (canceled)

~~16.~~ (previously presented) The receiver of claim 10, wherein the second mixer is a differential I/Q mixer that provides image rejection.

~~17.~~ (previously presented) The receiver of claim 10, wherein the first mixer and the second mixer are differential mixers.

~~18.~~ (previously presented) The receiver of claim 10, wherein the differential filter removes at least one channel from a plurality of channels received from the output of the first mixer.

~~19.~~ (currently amended) A receiver that processes a RF signal having a plurality of channels, the receiver comprising:

a substrate;
a first circuit, disposed on the substrate, that up-converts the RF signal to a first IF signal;

a differential filter, disposed external to the substrate, and having a passband that is higher in frequency than the RF signal and that removes at least one channel from the first IF signal;

a second circuit, disposed on the substrate, that performs image rejection and down-conversion and generates a second IF signal; and

at least the first IF signal comprising a differential signal.

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contd

20. (previously presented) The receiver of claim 19, wherein the second IF signal comprises a second differential signal.

21. (canceled)

22. (previously presented) The receiver of claim 19, further comprising an automatic gain control (AGC) circuit coupled to an output of the second circuit, and disposed on said substrate.

23. (previously presented) The receiver of claim 19, wherein the first circuit and the second circuit are differential mixer circuits.

24. (previously presented) The receiver of claim 23, wherein the second circuit is an I/Q differential mixer circuit.

25. (currently amended) A method for processing a RF signal having a plurality of channels, comprising:

(1) mixing the RF signal with a first differential local oscillator signal to produce a first differential IF signal;

(2) removing at least one unwanted channel from the first differential IF signal using a differential filter having a passband that is higher in frequency than the RF signal to produce a second differential IF signal;

(3) adjusting the first local oscillator signal so that a selected channel in the plurality of channels is shifted into a passband of the differential filter; and

(4) mixing the second differential IF signal with a second differential local oscillator signal to produce a second differential IF signal;
wherein steps (1), (3), and (4) are performed on a common substrate, and wherein step (2) is performed external to the common substrate.

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~~26.~~ (previously presented) The method of claim 25, wherein the plurality of channels are television channels.

~~27.~~ (previously presented) The method of claim 25, further comprising the step of:

(5) removing at least one unwanted channel from the second differential IF signal.

28. (canceled)

29. (canceled)

30. (previously presented) The method of claim 25, further comprising the step of:

(5) performing automatic gain control on the second IF signal on the common substrate.

31. (previously presented) The method of claim 25, wherein step (4) includes the step of removing at least one unwanted image from the second differential IF signal.

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32. (currently amended) A receiver for processing a plurality of channels, comprising:

a substrate;

a first differential mixer disposed on the substrate, and that performs up-conversion;

a differential filter coupled to an output of the first differential mixer and configured external to the substrate, wherein the differential filter has a passband that is determined to pass an up-converted output of the first differential mixer; and

a second differential mixer, disposed on the substrate and coupled to an output of the differential filter, said second differential mixer providing down-conversion and image rejection.

33. (previously presented) The receiver of claim 10, further comprising a first local oscillator disposed on said substrate and providing a first local oscillator signal to said first mixer.

34. (previously presented) The receiver of claim 33, wherein a frequency of said first local oscillator signal is varied to perform channel selection.

35. (previously presented) The receiver of claim 33, further comprising a second local oscillator disposed on said substrate and providing a second local oscillator signal to said second mixer.

36. (previously presented) The receiver of claim 35, wherein at least one of said first local oscillator signal and said second local oscillator signal are differential.

37. (previously presented) The receiver of claim 16, wherein said differential I/Q mixer includes a polyphase circuit that combines I and Q signals to provide said image rejection.

38. (previously presented) The receiver of claim 37, wherein said polyphase circuit is disposed on said substrate.

39. (previously presented) The receiver of claim 10, wherein said first mixer includes a differential input port, a differential output port, and a differential local oscillator port.

40. (previously presented) The receiver of claim 10, wherein said second mixer includes a differential input port, a differential output port, and a differential local oscillator port.

41. (previously presented) The receiver of claim 32, further comprising:
a first differential local oscillator disposed on said substrate and having an output coupled to a local oscillator port of said first differential mixer; and
a second differential local oscillator disposed on said substrate and having an output coupled to a local oscillator port of said second differential mixer.

42 (previously presented) The receiver of claim 41, wherein a frequency of said first differential local oscillator is varied to perform channel selection in said first differential filter.

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